ENTOPATH NEWS

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REMINDER!!!

Specimens and Descriptions to be sent direct to either the Pathologist or the Entomologist, the minute preferably being in the package with the material.

A copy of the minute and all subsequent correspondence to go via your Conservator.

Pathologist :

Entomologist :

FOREST RESEARCH STATION,
ALICE HOLT LODGE,
WRECCLESHAM,
FARNHAM, SURREY.

COMMONWEALTH 14 APR 1961

INTRODUCTION

Since the last issue of Entopath, the Forest Pathologist Mr. J.S. Murray has paddled his canoe out of the turbulent flow of the Research Branch into the quiet academic waters of the Forestry Department at Aberdeen University, where he is now a Senior Lecturer in Forest Botany. Mr. Murray has been one of the major contributors to Entopath since it began in 1954 and in recent years the newsletter has flourished under his editorship. We should like to record our appreciation of the part he has played in developing Entopath and in maintaining its high standard and popularity.

FIRE-BLIGHT

Much publicity has been given to this disease in the agricultural and horticultural press, and although the disease is of little or no significance in causing damage in forests, mention is being made of it here to underline its importance to the apple and pear growing industry particularly, and the obligations of everybody in notifying the disease wherever it occurs.

The disease, produced by the bacterium Erwinia amylovora, has caused very severe damage in orchards abroad, notably in North America and New Zealand. It was first found in this country in 1957 in Kent and has now been found in orchards in the important apple and pear growing areas of Kent, East Anglia and the Vale of Evesham. Other plants in the family Rosaceae are also attacked and in this country the disease has been recorded on hawthorn (Crataegus spp.), Rowan (Sorbus aucuparia), Whitebeam (Sorbus aria) and several species of Cotoneaster.

The symptoms of attack are very striking. In spring and summer blossoms and shoots of the affected trees turn black and wilt, and there is rapid spread of the symptoms back along the branch. The affected blackened branches may become cankered and a bacterial slime is produced from certain areas on the surface of the bark. This slime can be dispersed by rain splash, or by insects to healthy blossoms. The bacteria multiply in the nectar produced by the flowers and are further dispersed by pollinating insects.

The blackened scorched symptoms caused by fire-blight should not be confused by the premature bronzing or reddening of foliage which frequently occurs in late summer and early autumn and which

is often caused by root disorder or root infection by other organisms.

Under the Fire-Blight Disease Order 1958, symptoms of fire-blight disease must be reported immediately to the local office of the National Agricultural Advisory Service, or to the Ministry of Agricultural, Fisheries and Food (Plant Health Branch), Whitehall Place, London, S.W.1. This applies to symptoms on any species liable to infection, and failure to notify the disease and to deal with the infection as instructed can lead to prosecution. Although the symptoms are well defined, if there is any doubt about infection on orchard trees or the species mentioned above, you should not hesitate to inform the N.A.A.S. office or the Ministry. If you see suspicious symptoms, please, notify the agricultural authorities rather than Alice Holt, although we will of course immediately pass the notification on.

A concise illustrated pamphlet was produced by the Ministry of Agriculture in 1959 and copies of this can be obtained free from any N.A.A.S. office or from Whitehall.

SYSTEMIC INSECTICIDES

Quite some interest has been shown in this group of chemicals of recent years. Research started when some American workers noticed that certain plants, when grown on selenium-rich soils, were immune from attacks by insects, whilst those growing on normal soils were infested. This led to research into the possibility of treating plants with selenium compounds for insect protection. The experiments were extremely successful and it was found that the treated plants had absorbed the materials into their tissues, and, moreover, had distributed them to all their parts. Chemicals taken up by plants and translocated, i.e. transported within the tissues are called "systemics".

There was one snag however, selenium and its compounds are extremely poisonous to human beings. Lethal doses can be absorbed through the skin and very small quantities may cause death if taken orally. The next job therefore, was to find a less vicious material to do the job, and the search led to the so-called organo-phosphorus group of insecticides. These are slower acting, but some of them are still in the "very poisonous" category - respirators even have to be worn with some of them. Amongst the better known of these materials may be mentioned Schradan, the first of them all and one of the best, Systox, Dimefox, T.E.P.P. and Phosdrin, all effective but with high toxicity, and Rogor. This latter product, although somewhat evil-smelling has a lower mammalian toxicity than D.D.T., and, being "safe" it has become deservedly popular.

From the food grower's point of view, the perfect systemic translocates well and quickly, kills his pests, and breaks down within the plant into harmless compounds so that, at marketing, no toxic residues remain. This has led to the selection for sale by the trade of chemicals with a short "half-life" i.e. with a quick break-down within the tissues. The forester, of course, would like a very long half-life.

Unfortunately for foresters, conifers have very poor absorbtion of systemics through the leaves, and spraying the aerial parts is useless. If it is required, therefore, to make use of systemics, we have to resort to other methods:-

(1) By obtaining absorbtion through the bark by attaching a systemic-soaked band to each stem.

(2) By applying the chemical to the ground at the base of the trees, and thus, get the tree do the work by taking it up through the roots.

The cost of these operations, taken with the fact that none of the systemics are by any means cheap, rules out these methods for general forest insect control. Only a limited use for these chemicals remains. They are ideal for the control of the more secretive of our pests on hardwoods. A foliar application of, for instance, Rogor against a leaf-miner is a good tool to have in the workshop. Again this material may prove useful against leaf curling aphids, such as Cherry aphid, which are so difficult to reach with normal contact aphicides.

It may interest readers to know that last year the Entomology section tried a trunk banding method on P.39 larch at Mortimer forest, the object being to get a count of sawfly larvae in the crown. The dead larvae dropping from the tree were counted, as were the live larvae dropping for pupation in the Autumn. A comparison with the fall of larvae from untreated and treated trees showed that as many as 50% of insects were killed.

SOOTY BARK DISEASE OF SYCAMORE - CRYPTOSTROMA CORTICALE

Following the first record in 1945 in Wanstead Park, there was a dramatic and frightening spread of this disease on sycamores in north-east London and the London area generally. In the early 1950's, a natural decline in the severity of the disease occurred, until in 1956 when mention was last made of this disease in Entopath, it was

difficult to find active cases of attack in London.

Laboratory work showed that a relatively high temperature favoured growth of the fungus in artificial culture. From this it was suggested that high summer temperatures might be important in promoting spread of the disease and higher intensity of attack. However, following the hot dry summer of 1955, no increase in range or intensity of the disease was recorded. In the years following 1956, the disease remained quiescent, occurring mainly on small, often suppressed trees, and on branch stubs etc.

After the exceptionally dry conditions of 1959, it was thought that a renewal of the sooty bark disease survey was warranted in localities in and around London where the disease had previously occurred. This was carried out last autumn, and it became at once apparent that the level of attack was higher than for several years past. The severity of the disease observed in 1960 did not compare with that which occurred during the original outbreak, but several large trees were seen on which the whole surface of the trunk and the major branches had been converted into one great spore-producing blister, and it was evident that infection of this nature had developed very rapidly.

It is hoped that the climatic inclemency during 1960 will induce a withdrawal of the fungus, but the apparent relationship between high summer temperatures and disease incidence is still uncertain. Other major factors may be involved and it is important that this disease should be kept under close scrutiny in the near future. For this reason any suspicious symptoms on sycamore should be sent promptly to Alice Holt.

WIDESPREAD WATERLOGGING DAMAGE IN NURSERIES

During the month of March we have received a large number, more appropriately described as a flood of reports of waterlogging damage in nurseries. So far the plants worst affected are Douglas fir, Tsuga and Abies species, but going on our experience of last year it is almost certain that records of damage to larch, especially Japanese larch, will follow. The forebodings expressed in the last issue of Entopath have proved very true.

The general pattern in nurseries where Douglas fir and Tsuga have been affected has been very similar. Throughout the winter the stock has appeared perfectly healthy, but soon after the onset

of the unusually warm conditions from the end of February, widespread browning of foliage occurred. In some nurseries, stock had been lifted and despatched for planting prior to this, the serious root death on these plants passing unnoticed. When handling large numbers of plants, all of which appear quite healthy judging by the foliage this can very easily happen, the damage not being noticed until after planting, or until the plants are taken out of polythene bags prior to planting. With larch of course, there is no indication on the foliage of plants in the nursery that all is not well with the roots, and for this reason more losses after planting, caused by deaths of roots last autumn and during the winter in nurseries, will probably occur on larch compared with other conifers.

Unfortunately, the appearance of this article is too late to suggest the best treatment of the affected stock, which anyway could only be critical examination of the roots and vigorous culling, but foresters are warned that higher planting losses than usual may occur this year as a result of root damage in the nursery. If nothing else, the unusually wet conditions and resulting damage have forcibly brought out deficiencies in drainage in nurseries and no doubt appropriate remedial measures will be instituted.

In certain species, Nature has abruptly reduced the much talked of surplus of plants, but it is to be hoped that her assistance has not been over-effective in this respect.

THE PINE LOOPER SURVEY

Once more the annual survey for Pine looper pupae is almost completed and we can comment on results received. Up to time of going to press 40 units have sent in material out of the 44 which are at present involved in the survey. We would particularly like to convey our appreciation to all concerned with the field work, for their care and attention to detail. Odd items found during the sampling are received with interest and sometimes amusement, seeds, buds and deer droppings all indicate that anything that can be seen in the plots is being checked. One forester, who shall be nameless, sent in 61 items from 6 compartments and not one of them was a Pine looper pupa! But if any had been present we are certain they would have been found.

Cannock has a very high figure for the second year running. The survey compartment with the highest population having an average number of pupae per square yard of 25.4 compared with 17.4 in 1960.

This is necessitating extra surveying and its behaviour this summer will have to be studied. The northern block which had the highest counts in 1960 shows a drop in numbers but a rise is occurring over the whole area this year.

All the other English units show a drop or remain at very low endemic numbers. In Scotland however, six units show increases this year. Lossie and Inglismaldie show small increases; Innes House and Pitgaveny have highest compartment averages of 8.0 and 5.2 respectively; while at Culbin and Tentsmuir (both of which had control operations in earlier years) the populations are becoming significant. Culbin has produced an 8.2 against 2.6 in 1960 and Tentsmuir has jumped from an insignificant 0.4 in 1960 to a 7.6 this year.

Three more units are included in our survey this year bringing the total to be surveyed up to 47. These are Edensmuir in Fife-shire and Ampleforth and Allerston in Yorkshire. These units will help to fill the gap in coverage that existed between Tentsmuir and Laughton.

If our statisticians approve we hope to introduce a slight modification to our sampling procedure next year which will result in even less field work than is involved at the present time.

DAMAGE BY WOODPECKERS

Not infrequently, specimens of hardwood branches are sent to Alice Holt showing series of transverse punctures on the bark. The individual punctures are usually about $\frac{1}{4}$ - $\frac{1}{2}$ inch apart, and a line of these punctures extending round the stem can be seen to consist of adjacent shallow arcs of four or five. It is almost certain that this type of damage is caused by the feeding of green-woodpeckers. It generally occurs on oak, ash, willow and lime, but also on a wide range of other hardwoods. Research workers on the continent have shown that the initial damage by woodpeckers can lead to the formation of cankers, and it seems possible the brown flecking found in the wood of some hardwood species, notably in wil-low and poplar, can be partly attributed to the scattered and limited damage to the cambium caused by the pecking.

The distribution of the peck marks on the surface of the bark suggest that the bird is hunting for, rather than feeding on, insects, and it is possible that during transverse sweeps across the branch,

longitudinal insect galleries are located. Although it is not true in all cases, many of the trees are unthrifty as a result of root infection or other unfavourable factors and the birds are probably attracted by the increased insect activity on such trees.

We are not suggesting that green woodpeckers are a menace to hardwoods, but we would welcome further material of this type of damage and any information or observations that our readers can supply on this subject.

RHIZINA AND FIRES IN NEW PLANTINGS

Death of newly planted conifers following the spread of Rhizina from prep. ground fire sites was mentioned in Entopath No. 23, October 1959. At that time losses had been negligible in all the recorded cases except one. In the one exception severe losses occurred among pine and larch planted where a mature pine wood had been felled and the top and lop burned. A recent report from Holland describes Rhizina attack on up to 100% of young plants on clear felled sites where the slash was burned. Here pine species were mainly involved, but Douglas fir, which is resistant to Rhizina attack in the pole stage, was also affected. Since the presence of fresh conifer stumps and needle litter probably aids the spread and increases the virulence of the fungus, some control may be advisable where felled coniferous areas are replanted with conifers.

In Holland, heaping slash in rows instead of burning is recommended, and where this can be done without seriously hampering subsequent operations it is certainly a good method of control. Where top and lop has to be burned, however, trenching round fire sites should effectively prevent Rhizina spread. During the investigation into group dying in pole stage crops, it was found that Rhizina did not cross over well maintained drains, so a clearly dug trench, free from bridging roots and debris and going below the humus layer, should have the same effect. Since the establishment of Rhizina may be favoured by the presence of ground sterilised by fire, trenches should be made outside the scorched area, and the spoil from them should be thrown onto the fire sites to nullify the sterilisation.

More information about planting losses round prep. ground fire sites is needed, so if any of our readers experience this trouble in their areas, we should be grateful if they would let us know.